DETAILED ACTION

Response to Amendment

1. This in response to the Appeal Brief filed 11 March 2008 where Applicant raises question to the unexamined claims 45 and 46. Because of the unexamined claims 45 and 46, the finality of in the last Office dated 7 June 2007 action is withdrawn.

Claim Rejections - 35 USC § 112

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 46 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 46, the recitation "said gas concentration sensor" lacks antecedent basis.

Claim Rejections - 35 USC § 103

4. Claims 11-16 and 18-21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Moisan et al. (6,224,836) in view of Mutterer, Jr. et al. (6,258,329), Warmbier et al. (5,540,886) and Lautenschlager et al. (6,033,912). Moisan's invention is

directed to a gas treatment apparatus comprising a device for exciting a gas by a surface wave plasma. Moisan discloses in Fig. 6 that the apparatus comprises a source of microwave radiation **56**, a tube **40** made of a dielectric material such as silica through which tube a gas column to be excited flows, an enclosure comprised of hollow structure **24** and/or sleeves **42** and **44** made of an electrically conductive material (metal), a manifold **60**, a treatment unit **66**, a dehydration unit **68**, and sampling cells **78** and **80**. Moisan further discloses that the apparatus can be used for the purifying of gaseous effluents (col. 4, lines 15-17). As to the recited supply vessel, since Moisan teaches the use of the apparatus for the purifying of gaseous effluents and in Fig. 6 the gaseous effluents are introduced into the apparatus via one of its end, the gaseous effluents have to be introduced from a supply vessel. As to the added limitation "said system is configured to generate said high purity gas containing no more than 100 parts per million of water vapor", since Moisan discloses that his apparatus can be used for the purifying of gaseous effluents (col. 4, lines 15-17) and comprises a dehydration unit (Fig. 6 and col. 7, lines 13-18), Moisan's apparatus is capable of generating the high purity gas as claimed and inherently possesses the added claimed feature. If there is a further difference, it will be in the intended use of the apparatus. However, the manner or method in which such apparatus is to be utilized is not germane to the issue of patentability of the apparatus itself.

The differences between Moisan and the above claims are that Moisan is silent on the use of metal enclosure as the microwave reflecting enclosure and the provision of a gas concentration sensor and a feed-back control system. Mutterer teaches in a system for carrying out microwave assisted chemical reactions that cavities **12** and attenuator **13** are formed of structural metals that reflects microwaves (col. 4, lines 5-8) and a vessel 16 for holding materials in the cavity is of microwave transparent material while microwaves from the source are applied thereto (col. 4, lines 64-67). Mutterer also teaches the use of a control system **20** operatively associated with sensor(s) **17** (col. 4, lines 35-57). Both Warmbier and Lautenschlager teach the use a gas concentration sensor and a feed-back control system in an apparatus for processing gases with a microwave (see Fig. 1 in Warmbier and abstract in Lautenschlager).

As to the first difference, since Mutterer discloses the use of metals that reflects microwaves, it appears that Moisan's metal enclosure possesses the recited property in absence of evidence to the contrary.

As to the latter difference, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Moisan's teachings as suggested by Mutterer, Warmbier and/or Lautenschlager because this would result in efficiently controlling the process on a continuous basis. Further, it has been held the motivation to make a specific structure is always related to the properties or uses one skilled in the art would expect the structure to have, *In re Newell*

13 USPQ 2d 1248, *Fromson v. Advance Offset Plate* 225 USPQ 26; *In re Gyurik* 201 USPQ 552.

As to the subject matter of claim 16, material or article worked upon does not limit apparatus claims, see MPEP 2115. Further, since the recited material is not a structure of the device, it cannot be given any patentable weight.

5. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moisan '836 in view of Mutterer '329, Warmbier '886 and Lautenschlager '912as applied to claims 11-16 and 18-21 above, and further in view of Rostaing et al. (US 5,965,786). The difference between the references as applied above and the instant claim is the recited silica gel for the vapor removal device. Rostaing teaches the limitation in a gas treatment apparatus (col. 13, lines 55-60). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as suggested by Rostaing because the selection of any of known equivalent vapor removal devices would have been within the level of ordinary skill in the art.

6. Claims 32-34, 37, 39, 41-45 and 49 stand rejected under 35 U.S.C. 103 (a) as being unpatentable over Moisan '836 in views of Mutterer '329, Warmbier '886 and/or Lautenschlager '912. The **further** difference between the references as applied above

and the above claims is the provision that the reaction chamber is adapted to generate the gas under pressure. However, since the gaseous effluent is introduced into the apparatus via one of its end and has to be under pressure, Moisan's reaction chamber would also be under pressure in absence of evidence to the contrary.

As to the subject matter of claim 45, Moisan discloses it in col. 6, lines 63-67.

As to the subject matter of claim 49, Moisan's reaction chamber has the recited three portions.

7. Claims 35, 36, 38, 40, 46, 47 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moisan '836 in view of Mutterer '329, Warmbier '886 and/or Lautenschlager '912 as applied to claims 32-34, 37, 39, 41-45 and 49 above, and further in view of Rostaing '786. Moisan as applied above discloses that the apparatus for processing gases for the purpose of purifying them. The differences between the references applied above and the instant claims are the provision of the recited semiconductor device fluidly coupled to the manifold, the recited pump, the recited liquid, the recited mass flow controller and the recited concentric tube. Rostaing teaches the above limitations in a gas treatment apparatus (paragraph crossing cols. 5 and 6; col. 1, lines 45-51; col. 15, lines 46-54, col.11, lines 11-15 and col. 11, lines 60-65). As to the first difference, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references'

teachings as shown by Rostaing because this would result in getting the gas to be treated directly from the source. As to the third difference, since integrated circuit plant is operated in a vacuum, a pump is needed to transfer the gas to be treated therefrom to the gas treatment apparatus. As to the second difference, the provision of two plasma generator would increase the efficiency. As to the third difference, since Rostaing teaches the controlling of the flow rates of $C_2F_6/O_2/Ar$ gas mixture and Moisan discloses the same gas mixture, the provision of the mass flow controller or its equivalent for controlling the flow rates of $C_2F_6/O_2/Ar$ gas mixture would have been within the level of ordinary skill in the art. As to the last difference, this would result in preventing attack on the reaction chamber.

8. Claim 48 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Moisan '836 in view of Mutterer '329, Warmbier '886 and/or Lautenschlager '912 as applied to claims 32-34, 37-44 and 49 above, and further in view of Easly et al. (US 3,889,182). Moisan as applied above further discloses the use of the hollow structure 24 made of an electrically conductive material such as metal (col. 4, lines 55-58). The differences between the references applied above and the instant claims are the hollow material made out of steel vessel and having a microwave transparent window.

As to the steel material, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified

the references' teachings because the selection of any of known equivalent metals would have been within the level of ordinary skill in the art.

As to the latter, Easly teaches the use of a transparent window (Fig. 1 and col. 2, lines 33-35). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by Easly because this would result in allowing the microwave to pass into the hollow structure.

Response to Arguments

9. Applicant's arguments filed 11 March 2008 have been fully considered but they are not persuasive in view of the recent rejections as set forth in the paragraphs above.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kishor Mayekar/
Primary Examiner, Art Unit 1795